coronary plaque characteristics assessed by virtual histology intravascular ultrasound (VH-IVUS) on plaque shift during stenting.
Methods: Serial IVUS was performed pre- and post-procedure in 45 patients treated with stents. Volume index (VI: volume/length, mm^3/mm) was measured for lumen, vessel and plaque within the target (stent) segment and at 5-mm proximal and distal adjacent segments. By VH-IVUS, each plaque component, classified as fibrous, fibro-fatty, necrotic core or dense calcium, was quantified. At reference segments, significant plaque shift was defined as a $\geq$1.0 mm^3/mm increase in plaque VI from pre- to post-procedure.
Results: By gray-scale IVUS at pre-procedure, the significant plaque-shift group showed trends toward larger plaque burden with a greater degree of step-up/down in lumen VI from the target to reference segments (table). Pre-procedural VH-IVUS showed larger fibrous and fibro-fatty components at the target segment in the shift group than in the non-shift group with a similar tendency at the reference segments (table). In serial analysis, the significant plaque shift resulted predominately from a significant decrease in the fibrous component at the target segment (3.55±1.75 to 1.82±1.15 mm^3/mm, p<0.01) with a corresponding increase in the same component at the reference segments (2.39±1.03 to 3.23±1.11 mm^3/mm, p<0.01).

	Target (stent) segment			Reference segments		
	Plaque Shift	Non-Shift	p value	Plaque Shift	Non-Shift	p value
Conventional IVUS parameters at pre-procedure						
Plaque VI	9.22±3.20	7.49±2.55	0.07	8.04±1.84	6.13±3.22	0.05
Vessel VI	15.12±4.48	12.53±3.86	0.07	18.11±4.03	13.23±5.69	**<0.01**
Lumen VI	5.90±1.88	5.04±1.65	0.15	10.07±2.91	7.11±3.14	**<0.01**
Plaque components at pre-procedure						
Fibrous VI	3.55±1.75	2.60±1.11	**0.04**	2.39±1.03	1.65±1.22	0.05
Fibro-fatty VI	1.10±0.96	0.59±0.52	**0.03**	0.55±0.50	0.33±0.38	0.09
Necrotic core VI	1.03±0.45	0.93±0.64	0.64	0.68±0.65	0.56±0.57	0.51
Dense calcium VI	0.29±0.20	0.33±0.52	0.76	0.22±0.25	0.21±0.30	0.98

VI: volume index (mm^3/mm)

Conclusions: Pre-interventional plaque characterization predicted significant plaque shift during stenting better than conventional IVUS parameters. Compared with compliant plaque components that may be well compressed during stenting, a large amount of fibrous tissue at the target segment may lead to longitudinal plaque redistribution to the adjacent segments.

POSTERS

TCT-570

Intravascular Ultrasound Predictor of Late Lumen Gain of the Distal Reference Segments after Successful Percutaneous Coronary Intervention

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Background: A recent study reported that lumen area at the distal reference segments increases in 69 % of the patients with successful total occlusion recanalization at 6-month follow-up. Pathological studies have shown that vessel shrinkage is accompanied with folding of the internal elastic membrane (IEM). Peri-medial high echoic band (PHB) by intravascular ultrasound (IVUS) was observed during coronary spasm and PHB may suggest the presence of the folding of IEM. The aim of this study was to investigate IVUS predictor of chronic enlargement of lumen diameter at the distal reference segment of the target lesion after percutaneous coronary intervention (PCI).
Methods: Twenty seven patients with angina pectoris who underwent successful PCI were enrolled. IVUS was performed at the distal segment of the target lesion after successful PCI. Lumen diameter of the distal segment was measured by quantitative coronary angiography (QCA) analysis at baseline and at 9 months after PCI. Presence of late lumen gain (LLG) was defined as (lumen diameter at 9months) minus (lumen diameter at baseline) divided by (lumen diameter at baseline) of greater than 10 percent. Patients were divided into 2 groups according to the presence (LLG group: n=16) or absence (non-LLG group: n=11) of LLG. Quantitative and qualitative IVUS findings were compared between LLG group and non-LLG group.
Results: External elastic membrane and plaque plus media cross sectional area were similar between the 2 groups. Lumen cross sectional area tended to be smaller (4.1± 1.8 vs. 6.7± 3.4, p=0.07) and plaque burden tended to be greater (43± 15 vs. 33± 10, p=0.08) in LLG group than in non-LLG group. PHB was more frequently observed in LLG group than in non-LLG group (88% vs. 16%, p=0.007). By multivariate analysis, PHB was the only IVUS predictor of LLG (OR: 15.26, 95% CI: 1.10 to 211, p=0.042).
Conclusions: Presence of PHB by IVUS predicts chronic enlargement of the coronary segments distal to the target lesion.

TCT-571

The Impact of Predilatation on Bioresorbable Vascular Scaffold Expansion In Vivo – insights from Optical Coherence Tomography

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Background: Suboptimal metallic stent expansion may be associated with increased instent restenosis, TVR & stent thrombosis. Manufacturers' compliance charts relate implanted stent diameter to nominal size & deployment pressure, but these are based on in vitro measurements, & are unreliable in predicting final dimensions. Early data from bioresorbable vascular scaffolds (BVS) suggest low complication rates but concerns remain regarding mechanical strength/recoil, and there is limited real-world data on in vivo BVS expansion.
Methods: All patients receiving BVS at a single center from 08/12–06/13 were included. All lesions were predilated before BVS implant with postdilatation at operator discretion. OCT was performed after PCI to determine BVS expansion. Within each 1mm longitudinal interval of BVS segments, measurements were taken for minimum scaffold diameter (MSD) & cross-sectional area (CSA). BVS expansion was defined as MSD (or CSA) divided by predicted MSD (PMSD) (or PCSA). Central segments were defined as the middle 1/3 of the length of each BVS; peripheral segments those distal or proximal to central segments.
Results: 28 BVS (15/28 3.0 x 18mm) were implanted in 26 patients; most (25/28) were deployed at maximum recommended deployment pressure (16atm). 16 patients (62%) underwent postdilatation. In total, 480 frames of BVS segment were analysed. Overall, 99% of MSD (1.86-3.73mm; mean 2.84±0.34mm) were smaller than predicted (2.94-4.01mm; mean 3.43±0.3mm). Only 24% of analyzed frames achieved 90% of PMSD, & 6.9% the PCSA. Overall, BVS achieved 82.8±8.5% of PMSD and 82.5±12.0% of PCSA. Expansion was reduced in central vs peripheral segments (MSD 79.9±8.1% vs 84.4±8.3%, p<0.001; CSA 78.7±11.0% vs 84.6±12.0%, p<0.001), even in lesions predilated with 1:1 balloon:scaffold sizing (MSD 83.4±5.2% vs 88.5±6.3%, p<0.001; CSA 84.2±7.4% vs 88.6±8.7%, p=0.01).
Conclusions: BVS compliance charts are unreliable in predicting final in vivo dimensions, which may be dependent on lesion/vessel compliance. BVS expansion is reduced in the region of treated target lesions; as aggressive postdilatation is not recommended, our data highlight the importance of optimal predilatation before BVS implant.

TCT-572

Impact of calcium-deposit for left circumflex ostium narrowing after crossover stenting in distal left main bifurcation: An Intravascular Ultrasound Study in the Milan and Fukuyama Registry.

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Background: A provisional single-stenting is considered a default strategy for non-true bifurcation lesion in distal unprotected left main coronary artery (ULMCA). However, in certain cases, left circumflex artery (LCx)-ostium stenting may be necessary. The aim of this study was to evaluate predictors of residual LCx stenosis post ULMCA stenting according to baseline intravascular ultrasound (IVUS).
Methods: A total of 43 patients underwent percutaneous coronary intervention with drug-eluting stents for non-true bifurcation lesions in ULMCA. Pre-procedural IVUS was performed to measure cross-sectional areas at following segments: LMCA, left anterior descending artery (LAD)-ostium and LCx-ostium. Post-stenting-narrowing (PSN) at LCx-ostium was defined as more than 75% angiographic stenosis.
Results: PSN occurred in 19 (44.2%) patients. IVUS data are shown in Table. Calcified plaque at the opposite site of LCx-orifice was more frequently observed in PSN group as compared to non-PSN group (78.9% vs.16.7%, p <0.01). In multivariate analysis, the arc of calcium was an independent predictor of PSN.